Acid Rain in Algonquin Provincial Park

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THE FRIENDS OF
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Acid Rain in Algonquin Provincial Park

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by Dan Strickland

The term "acid rain" has become very familiar to North Americans in recent years and is of serious concern in areas like Algonquin Park. The low nutrient levels of Park lakes have always put a severe limit on the numbers of fish and their growth but this relative sterility also makes our waters particularly vulnerable to acid damage.

The problem has its beginnings (often hundreds or thousands of kilometres from Algonquin) whenever we humans burn coal or oil, or smelt ores. In so doing, we put millions of tons of chemicals into the atmosphere each year. Most of these chemicals are eventually washed out of the air and brought back to earth by rain or snow, but some of them — particularly sulphur dioxide and nitrogen oxides — react with the rain droplets on the way down and turn them into droplets of acid. Although the rain and snow which now falls in eastern North America won't burn your skin, it is still usually between 40 and 400 times more acidic than what rain used to be. It is sobering, to say the least, to realize that most fish would die from acid shock if we put them in a bucket of rain water.

In lakes and rivers fish are normally safe from acid rain because the water contains dissolved minerals (the "nutrients" we mentioned above) that quickly neutralize any acid rain that falls into them. But in Algonquin — and other areas of granitic bedrock — we know the lakes have extremely low nutrient levels and for that reason they have a correspondingly low capacity to neutralize or "buffer" the acid they now receive from virtually every rain or snow fall.

This vulnerability can put a lake at risk in two different ways. The first is that the buffering capacity of a lake may be entirely used up by repeated doses of acid rain and then, after that, more acid rain will turn the lake into a fishless vat of mild acid. This process has already occurred in thousands of lakes in Scandinavia, the Adirondack Mountains of New York State, and also in Killarney Provincial Park in Ontario. We also know of 15 acidified lakes here in Algonquin although our suspicion is that several, or even most, of these may be naturally acidic. Most are very small lakes completely or partly surrounded by very acidic bogs. A few of them are not bog lakes but it is worth noting that one (Maggie Lake on the Western Uplands Backpacking Trail) was discovered to contain no fish at all way back in the 1940's. Presumably this was well before man-created acid rain became a problem in Algonquin Park so there are good grounds for believing that Maggie Lake at least was acidified — and made fishless — for some other unknown reason long ago.

Be that as it may, there is a second way that lakes and the life in them may be damaged by acid rain. Even if a lake is not permanently acidified, it — or the top metre or two — may be temporarily overwhelmed in the early spring when highly acidic snow melts and suddenly flows into the lake. Even though the lake has enough buffering capacity to neutralize the layer of acidic surface water after a few days or weeks, this may be too late to prevent serious damage. This is particularly apparent when it is remembered that many of a lake's living creatures live in shallow places — precisely the areas that are bathed by the temporary "slug" of acidic meltwater. A lake trout spawning bed, for example, might be covered by the poisonous layer and a whole year's production of trout fry wiped out.

It is interesting to note that, later on, after the acid layer has been mixed with the rest of the lakewater and neutralized, someone measuring the acidity of the lake might find a pH reading of, say, 6.5 (typical of Algonquin lakes) and conclude that the lake was healthy. The problem would be, of course, that the

damage had already been done — by the rapid spring runoff of acid snow.

We believe that this second type of threat posed by acid precipitation is a far more serious problem in Algonquin Park than outright, permanent acidification of lakes. In this regard, the most important thing to know about a lake is not its pH, but, rather, the measure of its buffering capacity. A lake with a high buffering capacity has a good chance of neutralizing spring snow melts whereas a lake with a low buffering capacity is correspondingly more likely to be temporarily overwhelmed by the sudden acid inflow and to suffer damage from the resulting layer of acid surface water.

Scientists divide lakes into five "levels" according to their buffering capacities and it is instructive to see how Algonquin Park lakes fare in this classification, particularly because the sensitivity of our lakes ties in very strikingly with the underlying geology of the Park.

Of 604 lakes surveyed up to 1984, fifteen, mostly at high elevations in the Park's southwest corner, were classified as Level 1 or "acidified" as described above. At the other end of the scale, one lake was determined to be at Level 5 (high buffering capacity and total insensitivity to acid rain). This is Gilmour Lake lying on the limestone floor of the Brent fossil meteorite crater on the Park's north boundary. Another 61 were found to be at Level 4 (low sensitivity) and most of these are in the lower elevations of the Park's east side and often associated with major fault zones that are known to have a certain amount of calcium carbonate (source of a major buffering agent).

Most of the lakes in Algonquin (389 out of the 604 surveyed) are considered as Level 3 (moderately sensitive) and they probably experience damage only in years of extremely rapid snow melt. They tend to lie in the middle elevations of the central area of the Park.

Of greatest concern are the 138 extremely sensitive Level 2 lakes. These include many large, well-known lakes such as Louisa, Butt, Tim, McIntosh, Pinetree, and Little Otterslide. Generally speaking, they lie in a broad band stretching across the Park's southwest corner and straddling the Highway 60 corridor. This is a headwater area (along the height of land separating the Georgian Bay and Ottawa River watersheds) with very thin soil, and, of course, no upstream areas that might contribute buffering chemicals to the lakes found there. This is why the 138 Level 2 lakes have such a limited ability to neutralize acid and why they are so vulnerable to sudden acid shocks.

There is no doubt that the top metre or two of these extremely sensitive lakes is rendered lethal for some time each spring and there is good reason to expect biological damage. Fish losses due to acid precipitation may have already been observed, in fact, in Westward and Delano Lakes, two extremely sensitive (Level 2) bodies of water not far from Highway 60. These lakes have declining populations of white suckers and lake trout respectively, with no young fish present at all. Efforts to link these declines with acid rain have not yet turned up any incontrovertible evidence, however, so the connection between the two remains unproven — only suspected. Another possible effect of acid precipitation is that the temporary, partial acidification of lakes causes mercury to enter the food chain and contaminate fish (particularly large ones) to the point where they are unfit for human consumption.

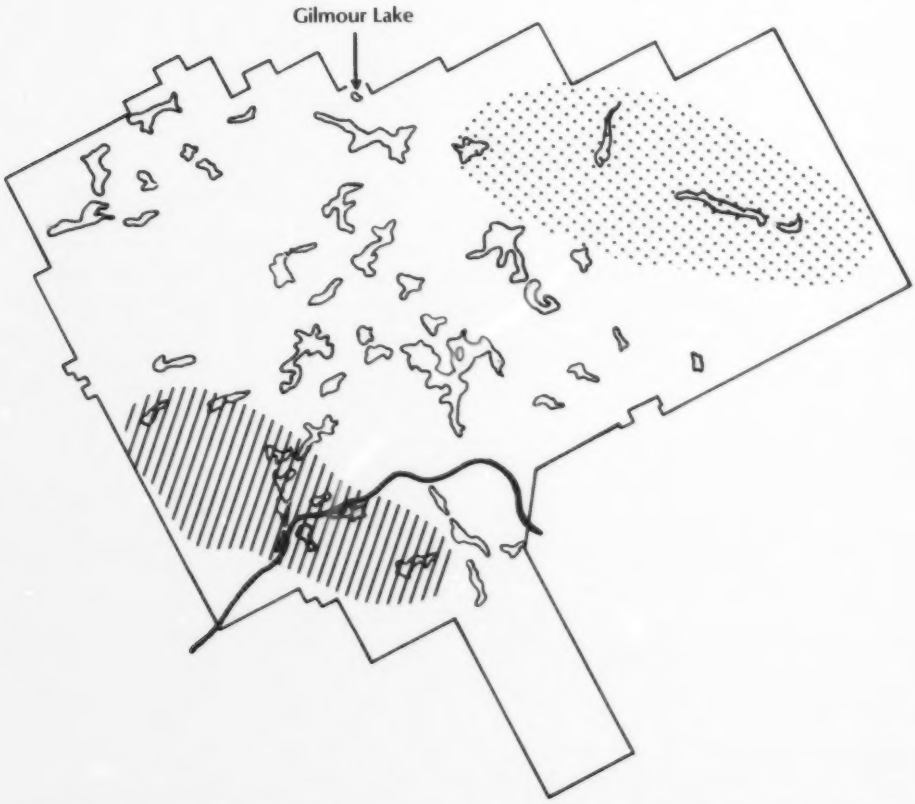
Notwithstanding the stress imposed on Park lakes by acid rain, it should be stressed that they are not all going to die of acidification. It is really only the extremely sensitive lakes (i.e. 23% of those tested) that are at risk and, even there, most of the danger is associated with the temporary springtime "acid shocks." The permanent loss of buffering capacity in these lakes (which could eventually lead to their outright acidification) is a very slow process and may even be slowing down because of recent efforts to control air pollution. This is encouraging but we must not lower our guard. If governments were to relax current pollution standards our rain and snow could quickly become more acidic than they already are and many lakes in Algonquin and elsewhere could be pushed over the delicate brink they are now poised upon.

Sensitivity of Algonquin Park Lakes

The Ontario Ministry of the Environment divides lakes into five classes according to their sensitivity to acid rain. Listed below are the 604 Algonquin lakes which had been tested up until 1984.

The lakes are presented alphabetically by sensitivity level. To learn the status of a particular lake, therefore, it may be necessary to check the list for each level. If the lake you are interested in does not appear in any of the lists it means that the lake in question has not yet been tested.

All of the lakes listed here are shown on a large push button electronic map in the Park Museum. This display shows the distribution of the sensitivity classes at a glance.



Of 604 Algonquin lakes tested up to 1984, 389 (64%) were found to be "moderately sensitive" to acid rain. Only 15 (2.5%) were considered acidified but another 138 (23%) were found to be extremely sensitive, meaning that they probably experience biological damage each year in the spring runoff period. These lakes are concentrated in the highlands (cross hatched area) straddling Highway 60 in the Park's southwest corner. Another 61 lakes (10%), mostly at lower elevations in the northeast part of Algonquin (stippled area) have low sensitivity. Gilmour Lake, lying on the limestone floor of the Brent fossil meteorite crater near the Park's north boundary is the only Algonquin lake that is totally insensitive to acid rain.

Level 1 (15 lakes - 2.5% of those tested)

These lakes are acidified with no, or very few, fish. Clam and snail species are also absent but some amphibians breed in these lakes very successfully (in part because there are no fish). Most Algonquin Park lakes in this class are small, highly coloured bog lakes that are believed to be naturally acidic.

Lake	Latitude	Longitude
Bat	45° 35'	78° 31'
Clyde	45° 18'	78° 16'
Corbeau	46° 07'	78° 22'
Drummer	45° 32'	78° 45'
East Alder	45° 48'	77° 53'
Furrow	45° 37'	78° 50'
Gill	45° 32'	78° 44'
Ink	45° 38'	78° 46'
Keegos	45° 42'	78° 02'
Little Drummer	45° 32'	78° 46'
Maggie	45° 30'	78° 52'
Pincher	45° 34'	78° 51'
Pipio	45° 24'	78° 30'
Sundance	45° 35'	78° 42'
Sunset	45° 34'	78° 56'

Level 2 (138 lakes - 23% of those tested)

These lakes are extremely sensitive to heavy acid rain loadings. Fish kills and other biological damage may occur during spring run off.

Lake	Latitude	Longitude
Acme	45° 40'	78° 58'
Alfred	45° 40'	79° 00'
Amikeus	45° 35'	78° 21'
Avery's	45° 23'	78° 21'
Baden-Powell	45° 38'	78° 41'
Bandit	45° 40'	78° 52'
Beaverly	46° 00'	78° 51'
Big Porcupine	45° 27'	78° 37'
Boggy	46° 00'	78° 53'
Bonnechère	45° 28'	78° 35'
Brown	45° 37'	78° 51'
Brûlé	45° 38'	78° 49'
Butt	45° 42'	78° 57'
Camp	45° 23'	78° 20'
Casey	45° 38'	78° 56'
Cashel	45° 34'	78° 52'
Charr	45° 54'	79° 05'
Chibiabos	45° 45'	79° 03'
Clara	45° 33'	78° 52'
Cloud	45° 35'	78° 24'
Coot	45° 30'	78° 44'
Cradle	45° 28'	78° 35'
Cranebill	45° 40'	78° 52'
Creation	45° 51'	78° 53'
Crossbar	45° 20'	78° 17'
Crown	45° 47'	79° 04'
Crystal	45° 23'	78° 29'
Dace	45° 31'	78° 48'
Daisy	45° 40'	78° 56'
Devil	45° 59'	78° 43'
Dividing	45° 24'	78° 36'
Falcon	45° 37'	78° 50'
Fava	45° 33'	78° 31'
Floss	45° 33'	78° 51'
Founders	45° 29'	78° 33'
Fraser	45° 31'	78° 19'
Frost	45° 22'	78° 27'
Gash	45° 56'	78° 39'
Gibson	45° 53'	78° 55'
Greenwood	45° 26'	78° 48'
Hambone	45° 40'	78° 58'
He	45° 41'	78° 41'
Iagoo	45° 44'	78° 58'
Indian Pipe	45° 46'	79° 03'
Iris	45° 38'	78° 35'
Islet	45° 37'	78° 53'
JEH MacDonald	45° 55'	78° 52'
Jack	45° 35'	78° 33'
Jay	45° 40'	78° 40'
Jewel	45° 41'	79° 00'
Jubilee	45° 40'	78° 54'
Kagh	45° 31'	78° 45'
Kathlyn	45° 36'	78° 32'
Kingfisher	45° 30'	78° 36'
Kirkwood	45° 29'	78° 33'
Ling	45° 29'	78° 37'
Little Coon	45° 26'	78° 35'
Little Eagle	45° 39'	78° 59'
Little Eastend	45° 34'	78° 57'
Little McCraney	45° 36'	78° 56'
Little Minnow	45° 39'	78° 20'
Little Misty	45° 41'	78° 52'
Little Otterslide	45° 41'	78° 36'
Loft	45° 36'	78° 46'
Louisa	45° 28'	78° 29'
Lupus	45° 33'	78° 47'
Mackinaw	45° 37'	78° 55'
Maiden	45° 35'	78° 42'
Maple Leaf	45° 28'	78° 50'
McCraney	45° 34'	78° 54'
McGarvey	45° 26'	78° 34'
McIntosh	45° 40'	78° 46'
Minnow	45° 30'	78° 51'
Minto	45° 30'	78° 38'
Misty	45° 42'	78° 47'
Mocassin	45° 40'	78° 52'
Mosquito	45° 31'	78° 30'
Muslim	45° 41'	78° 50'
Myra	45° 39'	78° 21'
Namakoutchie	45° 31'	78° 46'
Nid	45° 53'	78° 53'
North Grace	45° 26'	78° 32'
North Oak	45° 32'	78° 49'
Olive	45° 35'	78° 34'
Onagun	45° 47'	78° 19'
Paddy	45° 30'	78° 38'
Papukiwis	45° 45'	79° 06'
Pardee	45° 30'	78° 32'
Pauwatine	45° 55'	78° 58'

Phipps	45° 29'	78° 34'
Pinetree	45° 33'	78° 19'
Plough	45° 29'	78° 35'
Potter	45° 37'	78° 47'
Prottler	45° 27'	78° 20'
Provoking	45° 34'	78° 30'
Rain	45° 37'	78° 56'
Ramona	45° 31'	78° 47'
Ratrap	46° 02'	78° 51'
Red	45° 33'	78° 48'
Rod & Gun	45° 29'	78° 31'
Rosswood	45° 38'	78° 47'
Sam	45° 32'	78° 44'
Sawyer	45° 39'	78° 54'
Sisco	45° 58'	79° 04'
Sitting Duck	45° 27'	78° 28'
Skunk	45° 28'	78° 52'
South Canisbay	45° 30'	78° 36'
South Snowbird	45° 34'	78° 46'
Spa	45° 56'	78° 53'
Straight Shore	45° 40'	78° 47'
Stringer	45° 26'	78° 31'
Susan	45° 34'	78° 46'
Sylvia	45° 32'	78° 20'
Thunder	45° 32'	78° 48'
Tim	45° 45'	79° 02'
Timberwolf	45° 41'	78° 48'
Tonakela	45° 32'	78° 47'
Treefrog	45° 40'	78° 41'
Upper Head	45° 28'	78° 34'
Upper Redstone	45° 21'	78° 27'
Villeneuve	46° 07'	78° 33'
Wabanah	45° 50'	79° 00'
Way	45° 36'	78° 54'
Watson	45° 16'	78° 12'
Wee	45° 36'	78° 54'
Weed	45° 36'	78° 53'
Wenona	45° 41'	78° 52'
West Dolly	45° 39'	78° 56'
West Galipo	45° 23'	78° 28'
West Harry	45° 32'	78° 49'
West Otterpaw	45° 34'	78° 49'
West Smith	45° 35'	78° 15'
White	45° 30'	78° 30'
Wisp	45° 29'	78° 39'
Unnamed	45° 41'	78° 58'
Unnamed	45° 40'	78° 59'
Unnamed	45° 39'	78° 41'
Unnamed	45° 38'	78° 40'
Unnamed	45° 39'	78° 51'

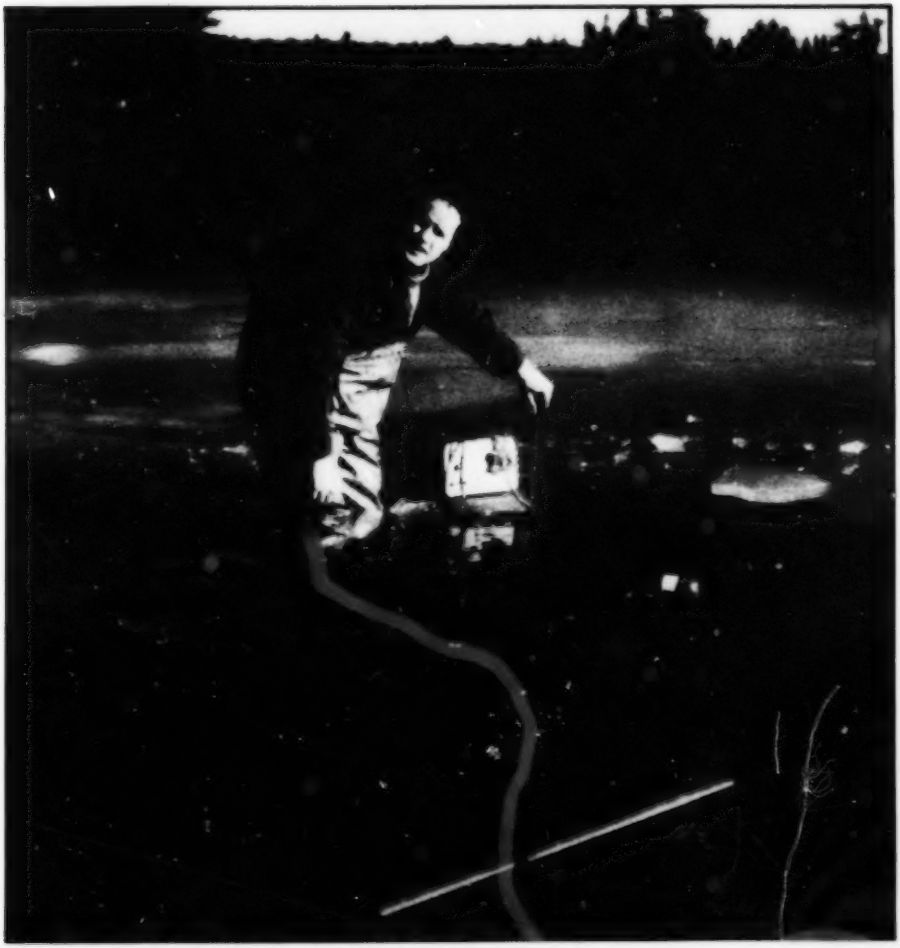
Level 3 (389 lakes - 64% of those tested)

Level 3 lakes are moderately sensitive to heavy acid loadings. Fish and other organisms are at less risk than in Level 2 lakes.

Lake	Latitude	Longitude
Airy	45° 35'	78° 13'
Alder	45° 39'	78° 36'
Alluring	45° 47'	78° 08'
Alsever	45° 41'	78° 00'
Amyoa	45° 39'	78° 32'
Animoosh	45° 46'	78° 08'
Aster Pond	45° 39'	78° 42'
Aubrey	45° 30'	78° 21'
Axton	45° 52'	79° 02'
Bab	45° 37'	78° 25'
Bailey	45° 36'	78° 13'
Band	45° 37'	78° 12'
Banshee	45° 39'	78° 31'
Barred Owl	45° 53'	78° 53'
Basil	45° 52'	79° 02'
Batise	45° 49'	77° 58'
Bear	45° 38'	78° 46'
Beaverpaw	45° 50'	78° 52'
Behan	45° 54'	78° 49'
Bena	45° 28'	78° 43'
Berm	45° 52'	77° 44'
Big Crow	45° 49'	78° 26'
Big Red	45° 41'	78° 05'
Big Rock	45° 13'	78° 12'
Big Trout	45° 46'	78° 37'
Biggar	45° 57'	78° 55'
Billings	45° 17'	78° 14'
Billy	45° 38'	78° 07'
Birchcliffe	45° 56'	78° 51'
Bishop	45° 51'	78° 36'
Bissett	46° 05'	78° 13'
Blackfox	45° 37'	78° 28'
Blue	45° 46'	78° 40'
Bluebell	45° 27'	78° 44'
Bluebill	46° 03'	78° 27'
Bluejay	45° 38'	78° 41'
Bluff	45° 35'	78° 20'
Bob Lake	45° 34'	78° 29'
Bog Pond	45° 46'	78° 49'
Bonita	45° 31'	78° 44'
Boot	45° 36'	78° 11'
Booth	45° 39'	78° 12'
Bower	45° 43'	78° 30'
Branch	45° 14'	78° 14'
Brewer	45° 35'	78° 19'
Bruce	45° 35'	78° 39'
Bud	45° 34'	78° 18'
Burnt Island	45° 39'	78° 39'
Burntroot	45° 52'	78° 41'
Burt	45° 55'	78° 50'
Byers	45° 14'	78° 12'
Cache	45° 33'	78° 34'
Calm	45° 55'	78° 52'
Cameron	45° 40'	78° 19'
Camp Five	46° 01'	78° 34'
Canada Jay	45° 40'	78° 42'
Canisbay	45° 34'	78° 35'
Canoe	45° 33'	78° 43'
Cap	46° 02'	78° 12'
Carl Wilson	46° 00'	78° 36'
Cat	45° 46'	78° 08'
Catfish	45° 57'	78° 33'
Cauchon	46° 04'	78° 41'
Cauliflower	45° 24'	78° 15'
Cecil	45° 27'	78° 30'

Cedar	46°	01'	78°	28'	Hawkins	45°	41'	78°	43'
Chattakoochee	46°	04'	78°	56'	Hayes	45°	54'	78°	38'
Chewink	45°	43'	78°	05'	Head	45°	31'	78°	34'
Chickaree	45°	46'	78°	31'	Hemlock	45°	48'	78°	33'
Chipmunk	45°	41'	78°	12'	Hermit	45°	36'	78°	21'
Chit	45°	38'	78°	32'	Heron	45°	27'	78°	49'
Cinderella	45°	56'	78°	27'	Hiawatha	45°	52'	78°	42'
Clarke	45°	33'	78°	16'	High Dam Pond	45°	46'	78°	49'
Claude	45°	29'	78°	41'	Hilcrest	45°	49'	78°	23'
Clydegale	45°	25'	78°	22'	Hilliard	45°	32'	78°	36'
Coldspring	45°	51'	78°	49'	Hiram	45°	38'	78°	28'
Coon	45°	32'	78°	25'	Hogan	45°	52'	78°	30'
Costello	45°	35'	78°	19'	Hogsback	46°	04'	77°	47'
Craig	45°	53'	79°	05'	Hornbeam	45°	57'	78°	58'
Creepy	45°	43'	77°	59'	Hot	45°	38'	78°	54'
Crossbill	45°	40'	78°	34'	Inez	45°	48'	78°	31'
Croy	45°	38'	78°	33'	Jake	45°	34'	78°	33'
Dahinda	46°	01'	78°	52'	Jocko	45°	49'	77°	54'
Dan	45°	43'	78°	39'	Joe	45°	35'	78°	43'
David	45°	42'	78°	58'	Jolly	45°	55'	78°	49'
Deerhorn	46°	02'	78°	07'	Kabibonoka	46°	03'	78°	22'
Devine	45°	47'	78°	47'	Kakasamic	46°	00'	79°	05'
Dickson	45°	48'	78°	13'	Kawa	45°	58'	78°	53'
Dove	45°	43'	78°	04'	Kearney	45°	34'	78°	26'
Duckpond	45°	38'	78°	06'	Kennedy	45°	52'	78°	46'
East Bruce	45°	59'	77°	45'	Kenneth	45°	31'	78°	34'
East Galipo	45°	22'	78°	26'	Kingscote	45°	12'	78°	13'
Edwin	45°	36'	78°	30'	Kioshkokwi	46°	05'	78°	53'
Eel	45°	38'	78°	34'	Kite	45°	37'	78°	34'
Eos	45°	36'	78°	21'	Kitty	45°	39'	78°	09'
Erables	46°	00'	78°	48'	Kootchie	45°	32'	78°	40'
Ermine	45°	26'	78°	52'	La Muir	45°	50'	78°	35'
Error	45°	42'	78°	34'	Two Rivers	45°	35'	78°	29'
Eu	45°	31'	78°	49'	Langford	45°	43'	78°	26'
Fairy	45°	45'	78°	06'	Laurel	46°	04'	78°	37'
Farm	45°	39'	78°	07'	Lavieille	45°	53'	78°	15'
Farm Bay	45°	28'	78°	19'	Lawren Harris	45°	54'	78°	52'
Farncomb	45°	53'	78°	18'	Lawrence	45°	30'	78°	32'
Fassett	46°	01'	79°	06'	Leaf	45°	34'	78°	18'
Fauquier	45°	39'	78°	49'	Lee	45°	46'	78°	12'
Fen	45°	27'	78°	47'	Lemon	45°	27'	78°	33'
Finch	45°	53'	78°	18'	Lilypond	45°	39'	78°	50'
Fisher	45°	33'	78°	23'	Linda	45°	37'	78°	36'
Floating Head	45°	46'	78°	56'	Little Billings	45°	18'	78°	14'
Florence	45°	27'	78°	28'	Little Branch	45°	17'	78°	15'
Fools	45°	40'	78°	32'	Little Canoe	45°	23'	78°	24'
Fork	45°	34'	78°	21'	Little Cauchon	46°	03'	78°	38'
Found	45°	33'	78°	38'	Little Cauliflower	45°	23'	78°	17'
Francis	45°	59'	77°	55'	Little Clear	45°	25'	78°	18'
Frank	45°	26'	78°	28'	Little Crooked	45°	50'	78°	11'
Galeairy	45°	30'	78°	17'	Little Crow	45°	48'	78°	27'
Gem	45°	29'	78°	22'	Little Dickson	45°	48'	78°	10'
Gerald	46°	02'	78°	10'	Little Goosander	46°	05'	78°	41'
Gordon	45°	31'	78°	23'	Little Hay	45°	21'	78°	16'
Grant	45°	33'	78°	34'	Little Hogan	45°	44'	77°	57'
Grape	45°	31'	78°	40'	Little Island	45°	32'	78°	38'
Grizzly	45°	53'	78°	26'	Little Joe	45°	36'	78°	42'
Gull	46°	02'	78°	34'	Little McCauley	45°	35'	78°	17'
Hailstorm	45°	41'	78°	33'	Little Mink	46°	05'	78°	50'
Happy Isle	45°	45'	78°	30'	Little Mohawk	45°	29'	78°	35'
Harness	45°	31'	78°	32'	Little Mykiss	45°	41'	78°	13'
Harry	45°	26'	78°	27'	Little Osler	45°	57'	78°	46'

Little Percy	45° 12'	78° 16'	Lostwater	45° 16'	78° 11'
Little Rock	45° 35'	78° 25'	Loughrin	45° 54'	78° 53'
Little Rock	45° 12'	78° 10'	Louie	46° 01'	77° 40'
Little Trout	45° 43'	78° 54'	Lower Minnow	45° 13'	78° 13'
Little Vesper	45° 38'	78° 18'	Loxley	46° 04'	78° 38'
Littledoe	45° 37'	78° 42'	Luckless	45° 57'	78° 35'
Lizz	45° 53'	78° 25'	Lynx	45° 56'	78° 35'
Lonely	45° 48'	78° 39'	MacKenzie	45° 55'	78° 17'
Longbow	45° 46'	78° 52'	Madawaska	45° 23'	78° 27'
Longer	45° 48'	78° 40'	Magnetawan	45° 40'	78° 59'
Longspur	45° 35'	78° 34'	Mama	45° 44'	79° 01'
Loonskin	45° 50'	78° 00'	Manabezi	45° 57'	78° 56'
Loontail	45° 50'	78° 52'	Mangotasi	45° 57'	78° 58'
Lorne	45° 59'	79° 03'	Manitou(Wilkes)	46° 01'	79° 00'
Lost Dog	45° 57'	79° 06'	Maple	46° 01'	78° 49'



Taking a water sample on Dickson Lake, December, 1986

March Hare	45° 34'	78° 42'	Pretty	45° 59'	77° 54'
Marion	45° 30'	78° 55'	Proulx	45° 46'	78° 24'
Marmot	45° 41'	78° 24'	Pugawagun	45° 44'	78° 57'
Mattowacka	46° 00'	79° 07'	Pukina	45° 54'	78° 25'
Meda	45° 56'	78° 58'	Queer	45° 43'	78° 53'
Merchant	45° 46'	78° 31'	Radiant	46° 00'	78° 17'
Merganser	46° 05'	78° 23'	Ragged Lake	45° 28'	78° 39'
Mew	45° 34'	78° 31'	Rainbow	45° 35'	78° 45'
Midget	45° 30'	78° 38'	Raja	45° 37'	78° 14'
Mikado	45° 28'	78° 44'	Ranger	45° 46'	78° 47'
Mildred	45° 28'	78° 30'	Raven	45° 35'	78° 39'
Milon	45° 34'	78° 15'	Redfox	45° 37'	78° 27'
Mink	46° 03'	78° 46'	Rence	45° 25'	78° 28'
Minnehaha	45° 51'	78° 43'	Robin	45° 40'	78° 05'
Minnewawa	45° 59'	78° 57'	Robitaille	45° 41'	77° 52'
Mishimokwa	46° 03'	78° 22'	Rock	45° 31'	78° 24'
Mohawk	45° 29'	78° 36'	Rorke	45° 59'	77° 48'
Mole	45° 37'	78° 14'	Rosebary	45° 46'	78° 55'
Moosehaunt	46° 05'	77° 48'	Rosepond	45° 31'	78° 23'
Moray	45° 38'	78° 41'	Round Island	45° 44'	78° 12'
Mountain	45° 43'	78° 12'	Roundbush	45° 42'	77° 59'
Mouse	46° 02'	78° 44'	Ryan	45° 41'	78° 06'
Mubwayaka	45° 43'	78° 56'	Ryegrass	45° 39'	78° 13'
Mudville	45° 42'	78° 05'	Sasajewun	45° 35'	78° 31'
Mykiss	45° 40'	78° 14'	Sawbill	45° 57'	78° 52'
Nadine	45° 57'	78° 44'	Scorch	45° 15'	78° 12'
Nahma	45° 52'	79° 06'	Scott	45° 29'	78° 44'
Namea	45° 59'	78° 55'	Scud	46° 03'	78° 47'
Nebanawbaig	46° 03'	78° 49'	Shad	46° 02'	79° 07'
Nepawin	45° 47'	78° 28'	Shah	45° 43'	78° 49'
Norman	45° 29'	78° 42'	Shall	45° 39'	78° 04'
North Cuckoo	45° 54'	78° 36'	Shallnot	45° 40'	78° 04'
North Galipo	45° 23'	78° 27'	Shawandassee	45° 26'	78° 48'
North Martin	46° 02'	79° 05'	Shawshaw	45° 45'	79° 01'
North Raven	45° 58'	78° 47'	Shiner	45° 44'	78° 33'
North River	46° 05'	78° 23'	Shippagew	45° 47'	78° 41'
North Sylvia	46° 00'	78° 53'	Shirley	45° 41'	78° 08'
North Tea	45° 57'	79° 03'	Shrew	45° 42'	78° 05'
Norway	45° 34'	78° 22'	Sinclair	45° 57'	78° 54'
One Mile	45° 58'	78° 50'	Sitting Man	45° 46'	78° 50'
Opeongo	45° 42'	78° 22'	Skuce	45° 58'	78° 46'
Osprey	45° 47'	78° 15'	Skylark	45° 51'	78° 10'
Osseo	45° 58'	78° 22'	Small	45° 27'	78° 45'
Otterslide	45° 43'	78° 36'	Smoke	45° 31'	78° 41'
Ouse	45° 33'	78° 40'	Snow	45° 25'	78° 49'
Owaissa	45° 40'	78° 06'	Solitaire	46° 01'	78° 41'
Owl	45° 36'	78° 38'	Source	45° 33'	78° 39'
Owlet	46° 06'	78° 14'	South Boot	45° 13'	78° 18'
Ozawabrek	45° 52'	78° 58'	South Galipo	45° 22'	78° 27'
Park	45° 25'	78° 51'	South McGuire	45° 26'	78° 19'
Peck	45° 33'	78° 39'	Southworth	45° 42'	78° 38'
Pen	45° 27'	78° 23'	Speckled Trout	45° 32'	78° 26'
Penaish	45° 39'	78° 29'	Splash	45° 33'	78° 56'
Pewee	45° 34'	78° 32'	Spot	45° 41'	78° 06'
Pezheki	45° 44'	78° 58'	Sproule	45° 37'	78° 22'
Philip	45° 55'	78° 24'	Squirrel	45° 47'	78° 24'
Pine	45° 40'	77° 51'	St. Anthony	45° 35'	78° 19'
Pishnecka	45° 54'	79° 03'	Stag	45° 47'	78° 45'
Plumb	45° 55'	78° 37'	Stubby	45° 16'	78° 19'
Pog	45° 34'	78° 27'	Sunbeam	45° 39'	78° 42'
Polly	45° 36'	78° 37'	Sundassa	45° 49'	78° 08'
Pond	45° 35'	78° 26'	Sunday	45° 36'	78° 24'

Sunny	45° 39'	78° 31'
Swallow	45° 41'	78° 40'
Swan	45° 30'	78° 43'
Tanamakoon	45° 33'	78° 37'
Tattler	45° 39'	78° 14'
Tea	45° 31'	78° 44'
Teardrop	45° 25'	78° 32'
Thistle	45° 32'	78° 18'
Thomas	45° 49'	78° 17'
Thompson	46° 09'	78° 47'
Three Mile	45° 59'	78° 54'
Tip Up	45° 41'	78° 16'
Titmouse	45° 36'	78° 25'
Tom Thomson	45° 38'	78° 44'
Totem	45° 58'	78° 52'
Traverse	45° 58'	78° 03'
Trout	45° 44'	78° 41'
Upper Kawa	45° 58'	78° 53'
Upper Minnow	45° 14'	78° 14'
Vanishing Pond	45° 38'	78° 40'
Vireo	45° 44'	77° 59'
Wabasso	45° 38'	78° 31'
Wahwahtaysee	45° 58'	78° 51'
Waterclear	45° 03'	78° 47'
Waymuk	45° 57'	78° 29'
Welcome	45° 25'	78° 25'
Whisper	46° 07'	78° 49'
White Partridge	45° 50'	78° 06'
Whitespruce	45° 30'	78° 49'
White Throat	45° 44'	78° 44'
Whitebirch	46° 04'	78° 49'
Whitefish	45° 33'	78° 25'
Whitegull	45° 40'	78° 27'
Whitney	45° 34'	78° 17'
Wib	45° 58'	78° 58'
Widgeon	46° 07'	78° 37'
Wigwam	45° 38'	78° 29'
Wilkins	45° 41'	77° 55'
Willow	45° 39'	78° 42'
Wolfland	45° 48'	78° 59'
Wright	45° 45'	78° 17'
Unnamed	45° 42'	78° 12'
Unnamed	45° 40'	78° 09'
Unnamed	45° 34'	78° 26'

Level 4 (61 lakes - 10% of those tested)

Lakes are of low sensitivity and likely to experience damage only under extreme snow melt conditions.

Lake	Latitude	Longitude
Allan	46° 06'	78° 17'
Barron	45° 51'	77° 58'
Basin	45° 44'	77° 48'
Browny	45° 55'	77° 57'
Bridle	45° 40'	78° 09'
Bunchberry	45° 55'	77° 43'
Calumet	45° 53'	78° 33'
Carcajou	45° 52'	77° 52'
Charles	45° 54'	78° 24'
Clemow	45° 54'	77° 55'
Clover	45° 45'	77° 44'
Clubb	46° 03'	78° 45'
Cuckoo	45° 53'	78° 32'
Deacon	45° 39'	77° 57'
Dodge	45° 42'	77° 43'
Dusk	45° 53'	78° 05'
East Plover	46° 00'	78° 13'
Eustache	45° 56'	78° 07'
Forbes	45° 56'	77° 48'
Fourcorner	45° 09'	78° 17'
Foys	45° 47'	77° 53'
Godda	45° 38'	78° 14'
Gouinlock	46° 03'	78° 39'
Grand	45° 53'	77° 49'
Greenleaf	45° 49'	77° 54'
Guthrie	45° 47'	77° 45'
Henona	46° 01'	78° 19'
Hidden	45° 45'	78° 05'
High Falls	45° 52'	77° 41'
Ignace	45° 53'	77° 35'
Johnston	45° 52'	77° 44'
Lantern	45° 59'	78° 31'
Leather Leaf	46° 01'	79° 04'
Linnet	45° 53'	78° 53'
Little Carcajou	45° 51'	77° 49'
Lost	45° 53'	77° 58'
Mathews	45° 58'	77° 44'
McDonald	45° 50'	77° 46'
McKaskill	45° 44'	78° 03'
Menona	46° 01'	78° 19'
Muskwa	46° 04'	78° 27'
Nod	45° 53'	78° 53'
North Branch	45° 50'	78° 04'
North Depot	46° 04'	78° 14'
Oram	45° 38'	78° 06'
Pan	46° 03'	78° 27'
Parkline	46° 05'	77° 48'
Rowan	45° 54'	77° 48'
Southwind	46° 01'	78° 12'
Spoor	45° 56'	77° 37'
Stratton	45° 51'	77° 44'
Sugarmaple	45° 41'	78° 29'
Swamp	45° 47'	77° 56'
Teal	45° 49'	78° 02'
Tecumseh	46° 05'	78° 28'
Thrush	45° 52'	78° 22'
Upper Spectacle	45° 50'	77° 48'
Wabe	45° 48'	78° 06'
Wendigoes	45° 58'	78° 26'
Whiskeyjack	45° 53'	78° 42'
Whistle	45° 52'	78° 42'
Unnamed	45° 56'	77° 47'

Level 5 (1 lake - 0.2% of those tested)

Such lakes are not sensitive to acid loadings, even in extreme snow-melt conditions during spring run-off.

Lake	Latitude	Longitude
Gilmour	46° 05'	78° 30'

Other Algonquin Park Publications

This technical bulletin is only one of many publications produced by The Friends of Algonquin Park. The Friends is an independent registered charitable organization with a volunteer board of directors and was established in 1983 to assist the Park with its educational and interpretive programs.

The following is a list of other Friends' publications available at our two bookstores (located at the Park Museum and the Pioneer Logging Exhibit) or by writing to the address below.

	(1989) Price
MAPS	
Canoe Routes of Algonquin Provincial Park	$2.50
Backpacking Trails of Algonquin Provincial Park	1.50
BOOKS	
Fishing in Algonquin Provincial Park	$1.50
Birds of Algonquin Provincial Park	1.50
Mammals of Algonquin Provincial Park	1.50
Reptiles and Amphibians of Algonquin	1.00
Pictorial History of Algonquin Provincial Park	1.50
Wildflowers of Algonquin Provincial Park	2.50
Mushrooms of Algonquin Provincial Park	2.50
Trees of Algonquin Provincial Park	2.95
TRAIL GUIDES	
Whiskey Rapids Trail	$0.35
Hardwood Lookout Trail	0.35
Mizzy Lake Trail	0.35
Peck Lake Trail	0.35
Hemlock Bluff Trail	0.35
Two Rivers Trail	0.35
Lookout Trail	0.35
Booth's Rock Trail	0.35
Spruce Bog Boardwalk	0.35
Beaver Pond Trail	0.35
Barron Canyon Trail	0.35
Brent Crater Trail	0.35
TECHNICAL BULLETINS	
No. 1. Checklist of the Butterflies of Algonquin	$0.75
No. 2. Checklist of the Bryophytes of Algonquin	0.50
No. 3. Wolf Howling in Algonquin Provincial Park	0.75
No. 4. Checklist of the Vascular Plants of Algonquin	1.00
No. 5. Acid Rain in Algonquin Provincial Park	0.75
No. 6. Checklist of the Conspicuous Fungi of Algonquin	1.00
No. 7. Checklist of the Lichens of Algonquin	0.50
No. 8. A Chronology of Algonquin Provincial Park	1.00

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